IR+ Assistive Listening System

A. Furnish and install a dual IR and Wi-Fi wireless assistive listening system for use by the hearing impaired. The assistive listening system (ALS) shall be capable of broadcasting via IR on 4 wideband channels (of which 2 can be operated simultaneously) to an unlimited number of users. A Wi-Fi multicast mode option must also be available with broadcast capability limited only by network capacity.

A1. Modulator/Server

The modulator/server unit shall provide 2 combined 3-pin XLR/TRS audio inputs that allow for connection to either a balanced or unbalanced line level analog audio source or a balanced or unbalanced microphone with selectable phantom power. The unit shall be offered with an optional Dante audio input. The unit shall provide dual ¼" headphone jacks for monitoring program audio. The unit shall provide 2 IR test LEDs for receiver testing, monitoring and audio signal testing. The unit shall provide a web control interface that allows users to configure and manage the unit including channel naming and channel security controls. The unit shall employ a DSP (Digital Sound Processor) with an adjustable - 60 - +24dB audio input gain in 1dB increments, automatic gain control, audio signal limiters, high and low pass filtering, and an adjustable-range audio compressor control in order to optimize hearing assistance for hearing loss, music for high-fidelity playback, and voice for maximum speech intelligibility through custom presets. The unit shall employ an ADC (analog to digital) that provides a 16-bit, 48 kHz digital stream. The unit shall have a signal-to-noise ratio of 67dB or greater and shall have an audio frequency response of 31 Hz - 16 kHz, ±3 dB and shall have a THD (total harmonic distortion) of less than 2% electrical response. The unit shall incorporate front panel buttons to control the unit via menus on a built-in OLED display. The unit shall provide a 400 Hz internal test tone.

a) Modulator/Server Infrared Operating Mode
The unit shall provide 4 RJ-45 ports for transferring baseband signals for IR transmission, +48VDC power and RS-485 communication via a single CAT5e/6 cable to IR emitters. The unit shall be capable of providing baseband signals on 4 wideband channels of which 2 can be operated simultaneously (2.3/2.8MHz or 3.3/3.8 MHz baseband frequencies).

b) Modulator/Server Wi-Fi Operating Mode
The unit shall provide a 10/100 Base-T Ethernet port to stream audio to the network and broadcast 2 channels of audio over an existing or new Wi-Fi wireless network.

A2. Emitter

One or several IR emitters shall be provided to transfer audio signals wirelessly to IR receivers. The unit shall have an RJ-45 port for receiving IR baseband signals, +48VDC power and RS-485 communication via a single CAT5e/6 cable. The unit shall be capable of transmit audio wirelessly on the infrared spectrum utilizing four wideband channels of which 2 can be operated simultaneously (2.3/2.8MHz or 3.3/3.8 MHz baseband channels). The unit shall have a coverage area of up to 18,000 sq ft (1,673 m^2) in single-channel mode when operated in combination with specified bodypack receiver.

A3. Array

One or several array units shall be provided to enable increased distance between the modulator/server and emitters. Array units may also be utilized to enable more than 4 emitter units to be connected to a single modulator/server. The unit shall have 1 RJ-45 port for receiving IR baseband signals and RS-485 communication via a single CAT5e/6 cable. The unit shall provide 4 RJ-45 ports for transferring baseband signals for IR transmission, +48VDC power and RS-485 communication via a single CAT5e/6 cable to IR emitters.

A4. Receivers

Dedicated IR multi-channel or Wi-Fi receivers shall be available to comply with legal assistive listening requirements. The devices shall employ a DSP to reduce background noise. The devices shall have the option of connecting a neck loop that sends optimized audio signals directly to hearing aids and cochlear implants equipped with telecoils. When connected to the dedicated IR or Wi-Fi receiver the neck loop shall have a magnetic field strength of 1.7 A/m (25 mW input @ 1000 Hz) 6" above the center of the loop.

a) IR 4-channel bodypack receiver

The device shall be a body-pack type with IR detector lens behind face of the unit. The receiver shall receive 2.3 MHz, 2.8 MHz, 3.3 MHz or 3.8 MHz modulated IR signals with 50 µS de-emphasis, selectable by a rotary knob. The receiver shall provide 18,000 sq ft (1,673 m^2) in single-channel mode when operated in combination with specified emitter. The unit shall have a lanyard for hands-free operation. The receiver shall have a rotary-type volume control. The receiver shall operate for 60 hours with two AA alkaline batteries and for 30 hours per charge with NiMH AA batteries. The receiver shall be charged without battery removal via charger contacts in the case. The receiver shall be housed in an impact resistant plastic case with a hinged battery door that does not separate from the receiver. The receiver shall have a 3.5 mm stereo phone jack and accommodate low-impedance mono or stereo earphones and headphones. The receiver shall accommodate neckloop telecoil couplers. The receiver shall provide 125 dB SSPL90 output with HED 021 headphone and 110 dB SSPL90 with EAR 013 earbud-type earphone. The system electrical frequency response shall be 25 Hz to 16 kHz, +1, -3 dB and the S/N ratio shall be 60 dB.

b) IR 2-channel stethoset receiver

The device shall have a stethoset type with IR detector lens behind face of the unit. The receiver shall receive 2.3 MHz, 2.8 MHz or 2.3/2.8MHz stereo modulated IR signals with 50 µS de-emphasis, selectable by a 3-position selection switch. The receiver shall provide 15,000 sq ft (1,393 m^2) in single-channel mode when operated in combination with specified emitter. The receiver shall have a thumbwheel type volume control. The unit shall have integrated headphones and in addition it shall have a 3.5 mm stereo phone jack and accommodate low-impedance mono or stereo earphones and headphones. The receiver shall accommodate neckloop telecoil couplers. The receiver shall utilize an integrated LiPo battery accommodating 8 hours of battery life.

c) Wi-Fi receiver

The device shall incorporate a setup button for configuration and shall incorporate a channel button that displays a list of available channels. The device shall have a multi-functional full color LCD touch display that allows users to choose a channel from a list of active channels, control and mute the volume and indicates battery status, channel and Wi-Fi connection status. The device's audio frequency response shall be 31 Hz - 16 kHz (±3 dB) and the signal-to-noise ratio shall be 67 dB or greater. The device shall have a USB connector used for charging and firmware upgrades. The device shall incorporate automatic battery charging circuitry and use a Lithium-Ion battery. The device shall be compatible with a multi-slot charger. The device shall have a battery life of 6 hours under normal conditions and charge time of two hours. The device shall have the option of being lanyard worn.

d) Wi-Fi enabled smartphone or tablet
Additionally, a dedicated downloadable iOS or Android listening app shall be available to allow users to use their Wi-Fi enabled smartphones or tablets. App will allow users to access available audio streams and adjust volume on their device.

B. Furnish and install the following:
1. Williams AV IR+ IR M1 Dual IR and Wi-Fi Modulator/Server (Qty: 1ea.)
2. Williams AV IR E4 IR Emitter (Qty: 1ea.)
3. Williams AV IR A4 IR Array (Qty: 1ea.)
4. Williams AV WIR RX22-4N 4-channel bodypack IR receiver (Qty: 1ea. or as needed, see note*)
5. Williams AV IR RX20 2-channel stethoset IR receiver (Qty: 1ea. or as needed, see note*)
6. Williams AV WaveCAST WF R1 Wi-Fi Receiver with EAR 022 Earphone, USB cable and single unit power supply (Qty: 1 each or as needed, see note*)
7. Williams AV BAT 026-2 AA NiMh rechargeable batteries for WIR RX22-4N (Qty: 2 each or as needed, see note*)
8. Williams AV CHG 3512 12-Slot Charger for WIR RX22-4N IR Receiver (Qty: 1 each or as needed, see note*)
9. Williams AV CHG 520 5-Slot Charger for IR RX20 IR Receiver (Qty: 1 each or as needed, see note*)
10. Williams AV CHG 1520 15-Slot Charger for IR RX20 IR Receiver (Qty: 1 each or as needed, see note*)
11. Williams AV CCS 062 BK Receiver Skin with Lanyard / Wrist Strap for WF R1 Wi-Fi Receiver (Qty: 1 each or as needed, see note*)
12. Williams AV CHG 404 WF 4-Slot Charger for WF R1 Wi-Fi Receivers (Qty: 1 each or as needed, see note*)
13. Williams AV CHG 404 WF 4-Slot Charger for WF R1 Wi-Fi Receivers (Qty: 1 each or as needed, see note*)
14. Williams AV HED 021 Headphones for IR receivers (Qty: 1 each or as needed, see note*)
15. Williams AV NKL 001 Neck Loop, 8-16 Ω, 20-20 kHz, 118 dB @ 1 kHz for IR receivers (Qty: 1 each or as needed, see note*)
16. Williams AV NKL 001 S Neck Loop, 8-16 Ω, 20-20 kHz, 118 dB @ 1 kHz for Wi-Fi receiver (Qty: 1 each or as needed, see note*)
17. Williams AV IDP 008 ADA Wall Plaque (Qty: 1ea.)

*The Americans with Disabilities Act (ADA) 2010 ADA Standards requires public facilities to provide auditory assistance devices:
http://www.ada.gov/regs2010/2010ADAStandards/2010ADAStandards.pdf (Section 706: Assistive Listening Systems)

For more about hearing compliance, visit https://williamsav.com/hearing-compliance/

ADA Table 219.3 & IBC Table 1108.2.7.1 Receivers for Assistive Listening Systems

Capacity of Seating in Assembly Area	Minimum Number of Required Receivers	Minimum Number of Required Receivers Required to be Hearing-aid Compatible
50 or less	2	2
51 to 200	2, plus 1 per 25 seats over 50 seats*	2
201 to 500	2, plus 1 per 25 seats over 50 seats*	1 per 4 receivers*
501 to 1000	2, plus 1 per 33 seats over 500 seats*	1 per 4 receivers*
1001 to 2000	2, plus 1 per 50 seats over 1000 seats*	1 per 4 receivers*
2001 and over	2, plus 1 per 100 seats over 2000 seats*	1 per 4 receivers*

* or fraction thereof

ADA/IBC Compliance Calculator: www.williamsav.com/ada-calculator

Network Analyzer
The WaveCAST Network Analyzer is a PC-based utility program designed for project planning, implementation and troubleshooting. Integrators and consultants can use the application during pre-sales site surveys to gauge a customer's network infrastructure for WaveCAST compliance. It can also be used post-install to check for changes in network performance. Available free of charge. Contact Williams AV's TechBlue team to get a copy of the Network Analyzer.

Contact Williams AV for customized quote to accommodate area:

+1 (952) 943-2252 | info@williamsav.com | www.williamsav.com

* Consultant Specs are available in Microsoft Word format. Call Williams AV.